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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,133	11/29/2000	Ramin Emami	AMAT/3976.P1/CMP/CMP/RKK	2919

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APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER

GOUDREAU, GEORGE A

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 08/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09-727,133

Applicant(s)

Emanal et al

Examiner

George Goudreau

Group Art Unit

1763

- The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address -

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☒ Responsive to communication(s) filed on 5-03' (re, - paper # 7)
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-4, 6-38, 40-60 is/are pending in the application.
- Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-4, 6-38, 40-60 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☐ All ☐ Some\* ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s) 2, 3, 5
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

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15. Regarding the 1449 forms which were submitted by the applicant, applicant is cautioned that US applications cannot be listed in the patent section but must be listed in the other document section. The examiner has therefore crossed out any incorrect listing of such documents on the 1449 form. The examiner recommends that applicant resubmit the IDS forms where appropriate with US patent applications listed under the other document section.

16. Claims 4, 8, 11, 14, 21, 23, 25, 38, 42, 45, 48, 54, 56, and 60 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

-In claims 4, 8, 11, 14, 21, 23, 25, 38, 42, 45, 48, 54, 56, and 60, the phrase "group of" should read "group consisting of" in order to be proper Markush claim language.

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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18. Claims 1-4, 6-38, and 40-60 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of U.S. Patent No. 6,432,826. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following.

US patent 6,432,826 claims essentially the same subject matter as that which is claimed in the current application.

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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21. Claims 1-4, 6-20, 22-38, and 40-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et. al. (6,436,302).

Li et. al. disclose a multi-step process for cmp polishing Cu/TaN layers used in the formation of a Cu damascene structure in an ILD layer on the surface of the wafer. The ILD layer is comprised of any of BPSG, PSG, or SiO<sub>2</sub>. The process is comprised of the following steps:

- The bulk of the deposited Cu layer is cmp polished on a first platen.;
- The remainder of the Cu layer, and the barrier layer are cmp polished down to the surface of the ILD layer on a second platen.;
- The copper oxide formed on the exposed Cu layer is removed by buffing the wafer with a solution which is comprised of citric acid (i.e.-a chelator), NH<sub>4</sub>OH, and H<sub>2</sub>O. (This solution also functions as a reducing agent since it reduce the copper oxide in the process of removing it from the surface of the copper. Thus, all of applicant's claimed limitations are fully met in this regard.);
- The wafer is treated with an inhibitor solution which is comprised of H<sub>2</sub>O, and any of BTA or methyl-BTA using a rinsing step.;
- The wafer is buffed again.; and
- The wafer is treated with an inhibitor solution which is comprised of H<sub>2</sub>O, and any of BTA or methyl-BTA using a rinsing step.

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This is discussed specifically in columns 4-8; and discussed in general in columns 1-8. This is shown in figures 1-4. Li et. al. fail, however, to specifically disclose the following aspects of applicant's claimed invention:

- the specific cmp polishing process parameters which are claimed by the applicant, and
- the specific pretreatment of the Cu layer with an anti-corrosive fluid prior to the cmp polishing of the Cu layer

It would have been obvious to one skilled in the art to pretreat the Cu layer with an anticorrosive fluid in the process taught above prior to cmp polishing the Cu layer based upon the following. The pretreatment of the Cu layer with an anticorrosive fluid prior to the cmp polishing of a Cu layer on a wafer is conventional or at least well known in the cmp polishing arts. (The examiner takes official notice in this regard.) Further, this would have desirably prevented the undesirable corrosion of the Cu layer during the cmp polishing process.

It would have been prima facie obvious to employ any of a variety of different cmp polishing process parameters in the process taught above including those which are specifically claimed by the applicant. These are all well known variables in the cmp polishing art which are known to effect both the rate and quality of the cmp polishing process. Further, the selection of particular values for these variables would not necessitate any undo experimentation which would be indicative of a showing of unexpected results.

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Alternatively, it would have been obvious to one skilled in the art to employ the specific process parameters which are claimed by the applicant in the cmp polishing process taught above based upon In re Aller as cited below.

“Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA).

Further, all of the specific process parameters which are claimed by the applicant are results effective variables whose values are known to effect both the rate, and the quality of the cmp polishing process.

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner George A. Goudreau whose telephone number is (703) -308-1915. The examiner can normally be reached on Monday through Friday from 9:30 to 6:00.

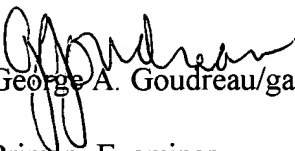
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Examiner Gregory Mills, can be reached on (703) -308-1633. The appropriate fax phone number for the organization where this application or proceeding is assigned is (703) -306-3186.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) -308-0661.

  
George A. Goudreau/gag  
Primary Examiner

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